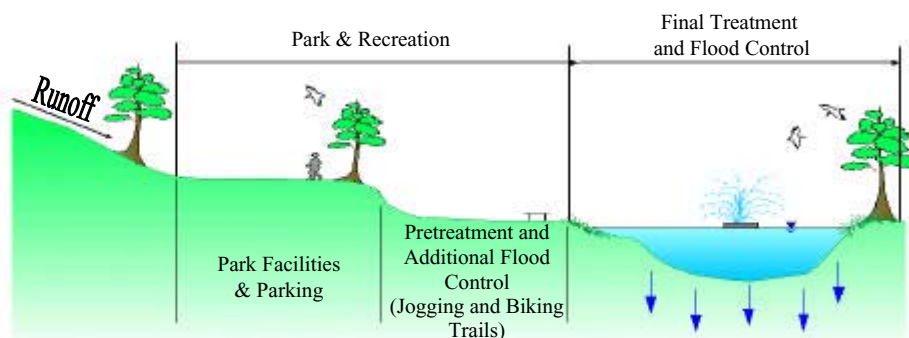


Floodplain Management: Best Management Development Practices



Description

Best Management Development Practices can be implemented in floodplain areas to provide floodplain conveyance, and reduce runoff volumes and peak flows associated with development. Best Management Development Practices include swales, detention/retention ponds, and infiltration basins. These practices are also highly effective when used in upper portions of the watershed.

Swales are vegetated conveyance systems that reduce runoff volumes and peaks by providing infiltration and storage. Swales can be used in place of curb and gutter systems to provide floodplain conveyance, flood control and water quality benefits.

Detention/Retention ponds act to detain floodwaters and release it to the downstream conveyance system at a reduced rate (e.g. post development rate = pre development rate). Detention/Retention ponds also provide water quality benefits when they are designed to detain the frequent storm events (e.g. 1-inch rainfall event).

Infiltration basins detain runoff and slowly release it into the groundwater, providing runoff volume control and water quality treatment for non-soluble contaminants. The effectiveness of infiltration basins is dependent upon the permeability of the soils and the depth to groundwater and bedrock.

Advantages

- ★ Provide reductions in peak flow rates.
- ★ Minimizes erosion and flooding downstream.
- ★ Can be designed to provide water quality benefits.
- ★ Practices can be implemented on-site or as a regional facility.
- ★ Applicable for new and re-developments.
- ★ Infiltration practices replenish groundwater supplies, augmenting low flows and preserving base flows in streams.

Disadvantages

- ☹ Requires maintenance.
- ☹ Infiltration basins are not appropriate for areas with poorly drained soils or high water tables and may require more maintenance than other practices.

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- ☹ On-site practices may increase downstream flooding potential if not designed with proper retention times.
- ☹ Difficult to incorporate into existing high density developments.
- ☹ Home associations may not have resources or knowledge to properly maintain the facilities.
- ☹ Site conditions determine infiltration capacity and limit flood reduction benefits.

Implementation Considerations

- Need to meet existing design standards to properly install facilities for flood control and may need updated standards to include water quality benefits.
- Need to consider cumulative impacts downstream.
- May require modifications of existing zoning ordinances.
- Maintenance responsibilities need to be specified and enforced.
- Public safety of wet detention facilities needs to be considered.
- Both mandatory and voluntary approaches can be used.
- Applicability to local topography and soil types.
- Lincoln's existing design standards may need to be strengthened to assist developers in designing practices that provide maximum benefit.

Example Communities

- Lake County, Illinois
- Overland Park, Kansas
- Fort Collins, Colorado
- Topeka, Kansas

References

The Wisconsin Storm Water Manual: Infiltration Basins and Trenches, University of Wisconsin – Extension, 2000.

City of Topeka Draft BMP Design Manual, Camp Dresser & McKee, Inc, December 2001.